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INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification 6 : A61B 5/00 | A1

(11) International Publication Number: WO 99/52422

(43) International Publication Date: 21 October 1999 (21.10.99)

(21) International Application Number: PCT/US99/08120

(22) International Filing Date: 14 April 1999 (14.04.99)

(30) Priority Data:
60/081,891 15 April 1998 (15.04.98) US

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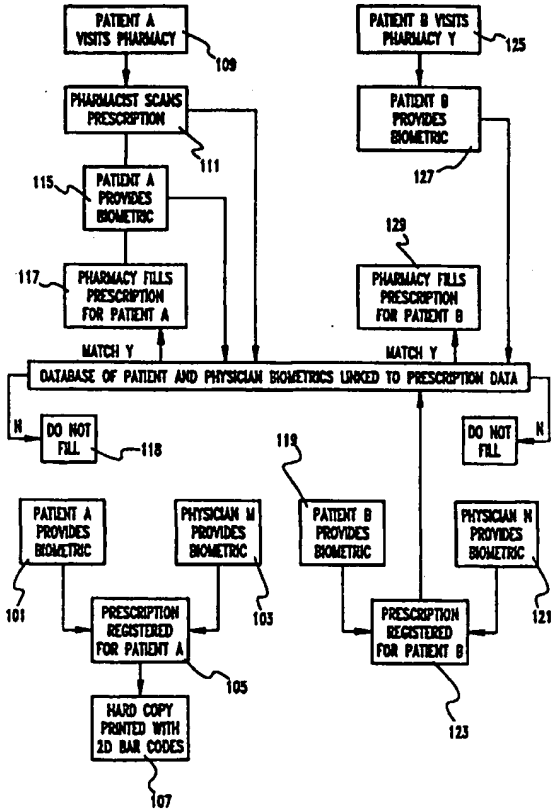
(81) Designated States: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZA, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

Published
With international search report.

(54) Title: METHOD, SYSTEM AND APPARATUS FOR BIOMETRIC IDENTIFICATION

(57) Abstract

This invention is a method of authorizing an action including the steps of providing recorded biometrics data preferably recorded within a two–dimensional bar code, obtaining biometrics data from an individual, comparing the obtained biometrics data from the individual with the recorded biometrics data, and proceeding with the action upon matching the obtained biometrics data with the recorded biometrics data. In a preferred embodiment, a physician prescribes a medication to a pateint to be filled by a pharmacist. The physician (103), the patient (101) record the biometrics data on a prescription (105), and a hard copy is printed having two–dimensional bar codes. The patient visits the pharmacy (109), and the pharmacist scans the prescription (111). The phamacist then obtains biometrics data from the patient (115), and compares the obtained biometrics data with the recorded biometrics data. The pharmacist fills the prescription (117) upon matching the obtained biometrics data with the recorded biometrics data.



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Method, System and Apparatus For Biometric Identification

TECHNICAL FIELD

This invention relates to use of biometrics and the internet and, more particularly, to systems, methods and apparatus wherein biometric linking of identity is enabled to authorize, verify and audit professional activities such as for practice like pharmacy and medical practice and for linking patient identity with physician prescription orders for patient medication.

BACKGROUND ART

Medications prescribed by physicians for patients are useful for treating the medical condition of a human subject. Consistent with good medical practice, it is necessary to conclusively link the prescribed medication with the identity of the human subject for whom the medication is prescribed. The standard method of identifying the patient in order to dispense medication is by using the patient name. In some cases, such as for filling prescriptions for controlled substances, the pharmacist may request additional information from the patient such as address or Medicaid card or the like. The standard method for ordering medication is for a physician to enter a prescription in the name of a patient. For example, the pharmacist receives a telephone call, typically from a prescribing physician or from a nurse authorized to act as a surrogate by the physician, providing the patient name and instructing the pharmacist which medication the patient is to receive and the dosage amount and schedule. The patient, if an outpatient, then visits or sends someone

to the pharmacy and receives the medication from the pharmacy after providing patient identification. Typically all that is required for the patient to pick up the medication is for the patient to state to the pharmacist their name or alternatively to provide a form of identification such as driver's license. For the ordering of controlled substance prescriptions including the prescribing of narcotics, for example medications such as Demerol, Dilaudid, Marinol or the like, the physician is typically required to provide in written or verbal form an identifier. For example, in the USA in order to have authority to prescribe such controlled medications, the physician must first register with the Bureau of Narcotics and Dangerous Drugs. Then when prescribing such medication to a patient the physician or his authorized representative such as his nurse must provide to the pharmacist his BNDD number as evidence the physician is currently licensed to prescribe such controlled substances. However, patients may circumvent the system easily such as by giving a fraudulent order form with for example a forged physician signature or a false patient name or incorrect address or by using another patient's Medicaid card. An associated problem for the pharmacy filling such fraudulent order is loss of revenue due to the fact billing in the circumstance where a patient gives a false name and a false address is seldom paid.

Also, in the ordering of medication there are problems such as when physician office staff communicate orders to the pharmacy on behalf of a physician. It is common practice in pharmacies to accept telephone orders from the physician's nurse for prescribing medication for a patient. This occurs often especially when the physician is busy, as for example in surgery, or otherwise unable to personally telephone the order to

the pharmacist. This circumstance leads in some cases to false orders, as for example when a physician office clerk leaves employment of a physician but retains a prescription pad wherein is listed the physician BNDD number. The former clerk then may pose as a representative of the physician and the clerk may fraudulently order via telephone a controlled substance medication prescribed in the name of a friend of the former clerk posing as patient. The pharmacy likely will fill such a prescription and the physician will typically be unaware since the clerk is no longer in the physician's employ. This type of fraud is especially difficult to detect where there is no feedback of such unauthorized orders to the physician under whose physician name the order is submitted.

When a patient picks up an outpatient prescription the pharmacist typically summons the person to the counter to collect the medication typically by repeating the name out loud or sometimes by spelling of the name. Errors occur where the person approaching the counter does not clearly understand the words the pharmacist says, as for example if the person approaching is hard of hearing or otherwise impaired such as under the influence of substance abuse. When a name is called and person approaches to picking up the prescription, the pharmacist may assume that the person approaching is the correct patient for that prescription and then typically the medication is given to that person. This occurs despite the correct patient name typically being typewritten on the prescription form or attached to the medication bottle or container as a further means of identification. Serious and occasionally fatal reactions have been known to occur when the wrong patient takes a medication prescribed for another.

Alternatively, in the inpatient setting, the physician writes an order for medication in the patient chart in the hospital and the pharmacy prepares the medication and delivers the medication to the floor where the patient has a bed. The nursing staff typically is instructed to dispense the medication only after identifying the patient in the bed by, for example, reading the patient name from that patient's wristband for identification. Errors are known to occur where busy nurses do not check the wristband but administer the medication to the occupant of a bed number assuming that to be the correct patient. For example the correct patient may have been moved to another bed.

Another limitation of the current systems occurs where a pharmacy fills a prescription written or ordered by an out of state physician. This occurs for example with prescriptions written on major clinic prescription forms such as Mayo Clinic or the like. Similarly, where the patient lives nearby across the state line in another state often the pharmacy will honor and fill such prescriptions from the physician in the other state. Where a person steals a prescription pad from such an out of state physician office or major clinic the person may forge the physician signature. Some pharmacies require that the prescription form be faxed to the clinic for verification prior to filling the prescription. However, often a pharmacy will unknowingly honor and fill such forged prescription and no feedback exists to alert the out of state physician or clinic of the forgery.

Patient identification systems for inpatient and outpatient pharmacy prescriptions and administration of medication are well known. Examples of systems for accomplishing this include US Patent No. 4,993,068

entitled Unforgeable Personal Identification System filed 27 November 1989; US Patent No. 5,071,168 entitled Patient Identification System filed 27 February 1990; US Patent No. 5,363,453 entitled Non-Minutiae Automatic Fingerprint Identification System and Methods filed 22 March 1993; US Patent No. 5,381,487 entitled Patient Identification System filed 18 September 1991; US Patent No. 5,291,560 entitled Biometric Personal Identification System Based on Iris Analysis filed 15 July 1991; US Patent No. 4,641,349 entitled Iris Recognition System filed 20 February 1985; US Patent No. 5,592,374 entitled Patient Identification and X-ray Examination Data Collection Bar Code System filed 2 July 1993; US Patent No. 5,637,851 entitled Laser Scanner for Reading Two Dimensional Bar Codes filed 14 February 1995; US Patent No. 4,488,678 entitled Method and Apparatus for Reading a Bar Code filed 3 June 1982; US Patent No. 4,977,601 entitled Method of Recognizing a Fingerprint filed 27 November 1987; US Patent No. 5,563,345 entitled Device for Ultrasonic Identification of Fingerprints filed 29 December 1994; US patent No. 5,682,142 entitled Electronic Control System/Network filed 29 July 1994; PCT Patent No. WO 98/50873 entitled Cyber Medicine Disease Management filed 1 May 1998, US patent No. 5,872,834 entitled Telephone with Biometric Sensing Device filed 16 September 1996 and US patent No. 5,883,370 entitled Automated Method for Filling Drug Prescriptions filed 5 June 1996 which prior art is hereby incorporated by reference.

Additional problems occur where a patient attempts to procure controlled substances via prescription from multiple physicians. In this circumstance a patient may convince one physician of the need for a controlled substance medication such as codeine for pain relief. The same patient may have recently visited another

physician and not disclose to the second physician that a first physician has recently written a prescription for the same patient for the same medication. In similar circumstances the patient may use a pseudonym such as maiden name and married name in order to receive one prescription under one name and the other prescription using another name. In this manner the patient is able to receive multiple prescriptions for a controlled substance. The patient then visits one pharmacy with one prescription order and has that prescription filled. The same patient then visits another pharmacy, perhaps in another city or county, and receives additional controlled substance medication by filling the second physician's order. The two pharmacies may be unaware of the situation wherein the patient is receiving more medication than appropriate. This situation may exist over a long period of time and occurs because the tracking systems for patient medications do not typically cover all pharmacies in a region or alternatively may not allow positive real time identification. Some states through the Board of Pharmacy receive data that is collated and reveals multiple simultaneous prescribing of control substances to a patient. The system is, however, typically after the fact, cumbersome and does not preclude the issuance of the medication.

Additionally where pharmacy prescriptions are processed over the Internet or other network systems, certain problems may arise. These include difficulty verifying true patient identity because of the distance of the patient from the prescribing physician. Similarly where the pharmacy is on-line, ordering the prescription is done electronically and then filling the prescription by mail can be carried out. However, in this circumstance, the identity of the patient and in

some cases the identity of the prescribing physician is more difficult to establish conclusively. Fraud is possible in Internet medication orders with respect to both patient identity and physician identity.

Problems also exist with currently available systems in that one physician may choose to prescribe more medication or controlled substance than is justified. This may occur where the physician is a party to efforts to sell prescribed medication or where the physician is receiving favors or other inappropriate remuneration from the prescribing of such controlled substances. The state board of pharmacy is often unable to detect such a pattern of unlawful prescribing habits in the early stages since reporting is often spotty or not collated by patient name or by prescribing physician name. In some circumstances no statewide or unified reporting mechanism exists. This audit function and oversight responsibility is especially difficult for a state board of pharmacy to carry out properly where prescriptions are filled across state lines.

Given these and other shortcomings in the art, the need for certain new and useful improvements is evident. There is a need for a system and method to positively identify the recipient of a medication as the individual for whom the physician prescribed that medication. Ideally the system will track on a real time basis the prescribing of medication linking the data to a unified database of patient identification that can be searched quickly and accurately on a real time basis. Such a system ideally will not rely on name alone but have the ability to independently verify the patient identity correctly and collate activity from one pharmacy to another and with relation to prescriptions from more than one physician and will function over a computer network optionally over the internet. Furthermore, such

a system will have the ability to identify each physician prescribing controlled substances and then collate such prescribing activity in relation to the individual physician prescribing records by patient.

DISCLOSURE OF THE INVENTION

The above problems and others are at least partially solved and the above purposes and others are realized in improved methods, systems and apparatus for linking patient identity with his or her prescribed medication prescriptions and with the health care provider prescribing said medication, and for optionally and substantially contemporaneously linking patient identity to medication request data as it is processed by one or more pharmacies. The instant invention incorporates by reference and cites as priority Provisional Patent 60/081,891 entitled Method, System and Apparatus for Matching Prescribed Medication to Intended Recipient filed 15 April 1998 which provisional patent is filed by same inventor and owned by the same entity.

In a particular embodiment, the instant invention may also provide registration within a database of biometric codes of physicians authorized to prescribe medication. Furthermore, the invention may also provide for registration of biometric codes from all ancillary personnel authorized to transmit verbal orders for prescriptions from a physician via telephone to a pharmacy. The invention provides for a means to verify the identity of a patient and to sort patient prescriptions according to patient biometric code. In a particular embodiment, the invention provides a method of linking a prescription by a physician with the identity of that patient for whom the medication is

prescribed, comprising the steps of collecting biometric data indicative of the identity of the patient, and linking the biometric data with the prescription of medication for that patient to form a prescription order expressing the physician request that said medication be dispensed to said patient. The steps of collecting the patient biometric data and prescribing the medication may occur substantially contemporaneously if desired. The step of collecting the physician biometric may, however, occur subsequent to the step of collecting the patient biometric code. The step of collecting the physician biometric may occur remote from the location of the patient and may occur via a biometric scanner linked to a cellular telephone or the like. The method may further include the step of storing the patient biometric code as linked to the prescription order to form a record in a database of a computer in the form of a data file. The method may further include the step of storing the prescribing physician biometric code as linked to the said prescription order to form a record in said data base linked to said data file. To ensure the record concerns a specific patient, the method may further include the steps of re-collecting biometric data indicative of the identity of the patient and comparing the re-collected biometric data with the biometric data of the prescription order and data file. The invention further provides a means for tracking professional activities of licensed professionals such as prescribing activities of physicians and of authorized surrogates such as nurses of said physicians. A further embodiment of the invention provides for a real time feedback to prescribing physicians of prescribing activities of their surrogates and others attempting to act as surrogates for a physician in ordering prescription medications.

BRIEF DESCRIPTION OF THE DRAWINGS

The foregoing and further and more specific objects and advantages of the instant invention will become readily apparent to those skilled in the art from the following detailed description thereof taken in conjunction with the drawings in which:

Fig. 1 is a flow chart illustrating a method of collecting patient biometric data and prescribing physician biometric data and linking the said biometric data with a prescription;

Fig. 2 is a flow chart illustrating a method of monitoring reports issued from a computer used for sorting prescriptions by biometric data of patient or prescribing physician or physician surrogates;

Fig. 3 is an illustration of a surrogate at a physician office receiving authorization by a physician to order medication in his name;

Fig. 4 is an illustration of a patient at a physician office receiving a prescription for a medication bearing a two-dimensional bar code;

Fig. 5 is an illustration of a physician authorizing a prescription by providing a biometric reading using a cellular telephone with built in biometric scanner;

Fig. 6 is an illustration of a nurse confirming patient identity as intended patient to receive a medication; and

Fig. 7 is an illustration of the authorization of a prescription over the Internet using biometric code authorization to a website.

BEST MODES FOR CARRYING OUT THE INVENTION

Ensuing embodiments of the invention comprise new and improved methods, systems and apparatus for linking human subject biometric measurements or data with his or her prescription for medication, prescribing doctor, data regarding prescription including amount of medication, type, refill orders, identity of patient and identity of physician.

The instant invention, in one embodiment, includes the use of a network of linked computers preferably with a computer at each pharmacy and at each physician office. The system uses, as identification for a person, a biometric measurement or data of a portion of the anatomy of that person. Biometric measurements or data can include fingerprint or iris of the eye patterns, or measurement of a function of the anatomy of said person such as signature or voice recognition or voice print, etc. Various biometric measurements or data and methods of collecting the measurements or data are disclosed in U.S. patent application serial number 08/686,211, filed on 23 July 1996 and entitled "Method, Apparatus and System for Anonymous Verification of Infectious Status of Humans" which is an invention of the same inventor and which is owned by the same entity, and hereby incorporated by reference. The biometric measurements or data are then encoded for storage in a computer database or other storage medium. Encoding typically takes place during the process of obtaining biometric data.

As a preferred embodiment, the use of an iris scan is herein disclosed wherein each physician authorized to prescribe medication such as controlled substances within a geographic region or jurisdiction, such as within one state, is registered by his or her iris code

created from an image of his or her iris. This registration is made using an iris scanner such as produced by IriScan of Marlton, New Jersey or the autofocus iris scanner of LG Technologies of Korea. The iris scan measurement is encoded and filed in a computerized database optionally within a single database of a central computer. The prescribing physician when prescribing a controlled substance for a patient will have in his office an iris scanner and will instruct the patient to enter iris data, typically from the right eye, into the scanner. This scanner is linked to the central database. The patient encoded iris scan data and the physician encoded iris scan data are thus linked in a data file which optionally includes further specifications such as time, date, prescribed medication and pharmacy for which the prescription is written. It will be understood that while an iris scan is used in this specific embodiment, other biometric measurements or data can be employed and encoded for storage into the computer data base.

When the patient visits the pharmacy to retrieve the medication or controlled substance, the pharmacy asks the patient to re-enter the iris data by using an iris scanner located at the pharmacy such as at the drive up curb side window or inside the pharmacy at the counter. The computer searches the database of iris codes of patients who are taking controlled substance prescribed medication in comparison to the newly encoded iris data entered by the visiting patient. When a match of encoded iris data occurs, the data is displayed to the pharmacist. In the circumstance where a patient has recently filled another controlled substance prescription in the same region, the data of the prior prescription is displayed, and alerts the pharmacist

that the patient may have a controlled substance abuse problem.

In another embodiment of the instant invention the computer at the physician office is a stand alone computer linked to a two dimensional bar code printer such as available from NipponDenso of Japan or Symbol Technologies of Holtsville, New York and an iris scanner. It will be understood that other biometric measurement devices and storage mediums can be used. In this specific embodiment the physician provides his iris pattern as the biometric measurement or data using the iris scanner which is linked to a computer that encodes the iris data as a two-dimensional bar code. The prescription form receives as a printout the two-dimensional bar code representation of said physician iris data. The patient for whom the physician is prescribing a controlled substance is then asked by the prescribing physician to enter patient iris pattern data using the iris scanner. The computer receives and encodes the iris measurement or data and causes the bar code printer to print onto the prescription form the two-dimensional bar code representation of the patient iris data. The patient then takes this prescription form to the pharmacy for filling. The pharmacy in this embodiment has linked to the pharmacy computer a two-dimensional bar code scanner such as available from NipponDenso of Japan or Symbol Technologies of Holtsville, New York. The prescription with the bar codes is given to the pharmacist who scans the bar codes. The computer recognizes the physician bar code as representing the iris data of the physician and sorts through the database of encoded physician iris data to find the match. The display of the pharmacy computer displays the name of the physician, which the pharmacist verifies matches the physician's name on the

prescription. The pharmacist then scans the patient bar code and the computer receives the encoded patient iris data. The computer compares the encoded patient iris data to the database of encoded patient iris data in the computer memory. Where the computer finds a match the display of the pharmacy computer displays the name of the patient found as a match which the pharmacist verifies matches the patient's name on the prescription. When a problem occurs, such as when the physician name from the computer database match of encoded iris data does not match the physician name on the prescription form or when a patient name from the computer database match of encoded iris data does not match the patient name on the prescription form, the pharmacist is alerted.

In the instant invention it is envisioned that the unified database of patients and physicians can be searched based on criteria of search. For example, a computer search can be performed for all patients receiving controlled substance prescriptions from more than five physicians within the past 12 months. Such a search of the database is enabled through the use of encoded iris data matching of patient to prescription and avoids name mix-ups or pseudonym. The data retrieved may alert authorities such as the state Board of Pharmacy to a problem in patient substance abuse. Similarly the database search criteria may be set to identify all physicians who prescribe more than a set number of controlled substance prescriptions within a 12-month period. The data retrieved may alert authorities such as the state Board of Pharmacy to a problem with a physician prescribing habits.

The accompanying drawings, in which like reference characters indicate corresponding elements throughout the several views, illustrate the foregoing embodiments

of the invention. Turning to Fig. 1, shown is a block diagram illustrating the steps involved for a physician prescribing medication for a patient and for a patient to receive said medication from a pharmacy. A patient A visits a physician M and physician M decides to prescribe medication for patient A. At the request of physician M, patient A at 101 provides a biometric measurement or data by having a biometric reading taken by a biometric scanner located, for example, on the desk of physician M and connected to a computer. At 103 physician M optionally provides biometric data using the same biometric scanner or optionally another biometric scanner. The computer and/or the scanner encodes the biometric data and links encoded patient A biometric data to the prescription order and electronically records the date and the order entered by physician M. In the preferred embodiment, the order is written onto a prescription pad that also contains the printout of a two-dimensional bar code encoding patient A biometric data or measurement and optionally also the physician biometric data and date. The physician then writes the prescription medication order, the amount of the medication and the dosage schedule onto the prescription form in the standard manner. At 109 patient A visits the pharmacy and delivers the prescription form to the pharmacist with the request that the prescription be filled. The pharmacist uses a two-dimensional bar code scanner linked to a computer to scan the bar codes on the prescription form. The two-dimensional bar code from the form provides to the computer of the pharmacy the encoded biometric data of patient A and optionally the encoded biometric data of physician M. The pharmacist then requests patient A to provide biometric data by using the pharmacy biometric scanner linked to the pharmacy computer at 115. The pharmacy computer

encodes the newly scanned biometric data and compares patient A biometric data as obtained from the prescription form bar code to the encoded biometric data provided by the person representing themselves as patient A and providing the biometric data at step 115. Where the computer comparison of the encoded biometric data determines a match the computer alerts the pharmacist of the match and the pharmacist verifies the patient name and fills the prescription at 117. Where the computer determines a match does not exist the computer signals the pharmacist who declines and does not fill the prescription as shown at step 118. The computer of the pharmacy optionally records encoded physician M biometric data in the database of pharmacy records as linked to the order for patient A medication submitted on the prescription form and presented to the pharmacist by patient A.

In the case of a database of encoded biometric data linked on-line to the physician office, a patient B is shown at step 119 receiving an order for medication from a physician N. Patient B is instructed by physician N to provide biometric data by using a biometric scanner in the physician office. Said scanner is linked by computer, which encodes the newly obtained biometric data, to the pharmacy database. The database optionally searches for a match to encoded patient B biometric data input at step 119. A match displays the name and demographic data and optionally the medication data for patient B onto the computer display screen of physician N. At step 121 physician N optionally enters his own biometric data which is encoded. The pharmacy database links the encoded physician biometric data to the order for medication that physician N is prescribing for patient B. Optionally, encoded physician N biometric data may necessarily precede and authorize the display

of any matching data found for patient B from search of the pharmacy database. At step 123 physician N enters the order for medication, specifying for example, the name of the medication, amount, dosage and any refill orders. The pharmacy database computer receives the order and provides physician N with information regarding the time the prescription will be ready. When the search of the pharmacy database for a match to encoded patient B biometric data retrieves data which physician N interprets as data indicating a problem with his intended prescription order, such as a pattern of abuse of prescription medications by patient B, then physician N optionally may delay or cancel his order for additional medication. Similarly where the search for patient B match demonstrates a pseudonym for patient B wherein patient B has received controlled substances under an assumed or different name, the physician may optionally notify authorities or optionally may counsel patient B regarding need for drug rehabilitation or the like. The database optionally records a record of the data provided to physician N at the time of match of encoded patient B biometric data in a format whereby the record can be audited by computer program. Where encoded patient B biometric data is not found to match encoded patient biometric data in the computer database, then a new file can be created for patient B and linked to physician N as the prescribing physician. Where physician N decides to continue with the prescription at step 123, physician N enters the medication order which order is received by the pharmacy computer and entered into the pharmacy computer database. At step 125, patient B visits pharmacy Y which may be a different pharmacy from pharmacy X visited by patient A. The computer database of pharmacy X is optionally linked to the computer database of pharmacy Y and optionally

linked by unified database to a state Board of Pharmacy computer suitable for search and report functions for the state board regulatory oversight functions. Patient B provides to the pharmacist at pharmacy Y her patient name and states that she is present to pick up the prescription medication ordered for her by physician N. The pharmacist asks patient B to enter her biometric data using the biometric scanner at the pharmacy and attached to the pharmacy computer. At step 127 patient B enters biometric data using the same portion of her anatomy as she used in the physician B office. In the embodiment described it is envisioned that the anatomy used is the same part of anatomy for each patient, in other words standardized i.e. all patients use the right eye for iris scan or alternatively all patients use the index finger of the right hand for fingerprint biometric data. The biometric data of patient B is received via the pharmacy biometric scanner and encoded by the computer of the pharmacy and the computer then searches the database to retrieve the order having matching encoded patient biometric data. The computer displays the search results for patient B and the pharmacist makes the determination whether the data are in order or alternatively whether the data suggest a problem. Problems can include a pattern of medication drug abuse by patient B indicated by previous prescriptions filled for the patient using a patient pseudonym or the like. Where the search indicates the order is correct and the pharmacist determines that the order should be filled, the pharmacist at step 129 fills the order. The computer database records the order as filled and links patient B name and biometric data to the filled order and places this information into the database as an update to patient B file. Similarly, physician N's name is linked to the filled order and placed into the

database linked to physician N's data file. Where the pharmacist has a question whether the order should be filled, for example where the search data displays a match to records for patient B indicating several physicians have recently prescribed similar controlled substances for patient B, then the pharmacist may delay the filling of the physician N order. Optionally, the pharmacist can telephone physician N and inform physician N of the multiple physician orders for controlled substances for patient B. Where the patient sends another person to pick up the prescribed medication the biometric data of that person is optionally registered as a person picking up medication. The database of such persons who pick up medication is established and the computer can optionally match the encoded biometric data of a person appearing to pick up medication for another against the database of individuals who have previously picked up medication for others. In this way the frequency of a person picking up medication for another person is monitored for indication that a person is picking up medication from multiple pharmacies and for multiple individuals as might indicate a pattern of substance abuse in the case of fraudulent controlled substance prescriptions.

It is envisioned that the step of a physician ordering a medication prescription in the instant invention can be a surrogate carrying out the order of the physician. For example, all those authorized to carry out such a medication prescription input for physician N are registered by encoded surrogate iris data linked to encoded physician N iris data. The surrogate iris data is again re-entered when the surrogate orders a medication prescription for a patient following order to do so from physician N. The entry of the surrogate iris data is encoded and linked in the

computer to the order and the data file is linked to physician N name and encoded biometric data. Thereafter when the activity is audited as shown in Fig. 2 the surrogate name is listed in the report of physician N ordering activity. Similarly where a person alleging to be an authorized surrogate for physician N is, in fact, not registered as a surrogate by iris data (or other biometric data), that person, when entering his or her iris data during the ordering of a medication prescription, will not match the surrogate biometric list linked to physician N's name. Hence the biometric data of the alleged surrogate will not be accepted by the pharmacist who will be alerted to the attempt and who may choose to report such activity to physician N or to the state Board of Pharmacy.

Turning now to Fig. 2, the audit function of the system is detailed. The database of prescription data linked to physician biometric data and patient biometric data and physician surrogate biometric data is optionally prompted each month to print out a series of reports. These reports provide the State Board of Pharmacy with oversight data regarding the medication ordering activities of each physician or health care provider registered in the system. Similarly, the reports provide the State Board of Pharmacy with oversight data regarding the medication prescriptions filled for each patient registered. In step 201 the computer audits the database and prints a monthly activity report regarding physician M. At 203 the data which appears on the report wherein a medication prescription was ordered by physician M for Patient A on the date specified and through the entry of biometric data of an authorized surrogate whose name is listed on the report, is summarized. The report in step 205 is automatically sent by e-mail or optionally by standard

mail to physician M. At step 207 the report is automatically sent by e-mail or optionally by standard mail to the State Board of Pharmacy. At step 209 the database computer audits the database to produce a report specific to patient B. The specifics of this report are summarized at 211 wherein physician N prescribed medication on a specific date for patient B with surrogate Y placing the order. In addition, this report includes four prescriptions entered for patient B by surrogate X for physician P. This data when sent to physician P, optionally by e-mail, may alert physician P that an unauthorized surrogate ordering activity is occurring. In the circumstance where physician P did not order such prescriptions be placed for patient B listed on the report, Physician P may alert the authorities. In addition, the feedback of activity under his name may alert physician P that surrogate X needs to be deleted from physician P linked list of authorized surrogates. Also, the report indicates that physician Q ordered medication for a patient whose biometric data matches patient B biometric data, but who used a patient pseudonym. In this circumstance, physician Q may call the pharmacy and report this apparent inconsistency. The report is sent to the state Board of Pharmacy at step 217. Each physician linked to patient B medication orders at step 215 receives a report concerning patient B which references that physician's listed data and which optionally alerts all the physicians that patient B has a report that raises a question regarding unusual medication use and potentially substance abuse.

Turning now to Fig. 3, illustrated is the use of multiple biometric scanners of two types within the scope of the instant invention. Physician 312 undertakes steps to register a surrogate 314 by first

inputting his own iris data via iris scanner 305 coupled to computer 307. Physician 312 then inputs his own right index finger image as biometric data via fingerprint scanner 301 coupled to computer 307. Iris scanner 305 may be from IriScan Inc. of Marlton New Jersey and fingerprint scanner 301 may be from UltraScan Inc of Holtsville New York. The physician biometric data is encoded and compared to stored encoded biometric data. Physician 312 receives from computer 307 an indication that physician 312 is recognized and then physician 312 enters onto keypad 303 of computer 307 instructions to register surrogate 314 as surrogate of physician 312 authorized to carry out input of medication prescription orders for physician 312. Computer 307 indicates via display on monitor 311 that the computer is prepared to accept and register biometric data of surrogate 314 to be linked to physician 312 data file. Then physician 312 instructs surrogate 314 to enter surrogate iris data of left eye using iris scanner 317. Then computer 107 signals surrogate 314 to enter right hand index finger biometric data via fingerprint scanner 319. This input of dual surrogate biometric data registers surrogate 314 as surrogate for physician 312. Physician 312 is enabled to specify which type of medication prescriptions surrogate 314 is authorized to order in the name of physician 312, for example non-control substances. The computer database optionally registers surrogate 314 for a specific time period, for example for 1 year. At the end of that time computer 307 prompts physician 312 to re-enter his dual biometric data in order to re-certify surrogate 314 as his surrogate for an additional year. In this manner a surrogate who leaves the employ of physician 312 is automatically removed from the surrogate list if not re-certified by physician 312. A

printer 321 can be linked to the system to print a hard copy 322 of the registration. Hard copy 322 preferably includes a two-dimensional bar code 323 representative of the encoded physician iris data and fingerprint data and optionally the time and date physician registered the surrogate and a two-dimensional bar code 325 representative of encoded iris data and fingerprint data of the registered surrogate.

Turning now to Fig. 4 illustrated is a patient 414 receiving a medication order from a physician 412. In this circumstance physician 412 instructs patient 414 to place a finger onto fingerprint scanner 415 and physician 412 is at the same time positioning the iris of his eye into view of an iris scanner 417. Each scanner is linked to a computer 416 of the system which encodes and stores the biometric data. In this example, the physician has previously been registered into the system using his iris data only. The computer recognizes physician 412 based on a comparison of his stored encoded iris data and re-input of his iris data. Similarly for this illustration patients are identified by fingerprint data. Therefore the registration of patient 414 occurs via the input of her fingerprint data. Physician 412 encoded biometric data and patient 414 encoded biometric data are linked by computer 416 in a data file representing the prescription and linked to time and date of prescription order. Physician 412 then enters into the computer the prescription information for patient 414. If computer 416 is coupled to a network, such as the Internet, patient 414 may proceed to the pharmacy without the need to carry a paper prescription sheet since the computer at the pharmacy has access to the electronic prescription and will recognize patient 414 from the fingerprint data. Optionally, computer 416 prints, via linked printer 419,

a corresponding set of two-dimensional bar codes onto a prescription pad sheet 418. Two-dimensional bar code 423 is representative of the encoded iris data of physician 412 and the time and date of order and two-dimensional bar code 425 is representative of the encoded fingerprint data of patient 414. In this circumstance the physician 412 may write onto the prescription pad sheet 418 the details of medication he is prescribing for patient 414 including medication name, amount and dosage. The patient then is given the prescription form to take to the pharmacy for filling. Because the bar code includes the time and date of the medication order as represented in code form in the two dimensional bar code, the copy of the bar code cannot be duplicated and successfully used later to fraudulently represent that the copy is a prescription of a purported later date.

Turning now to Fig. 5, illustrated is a patient 414 at the pharmacy delivering a prescription form 418 to a pharmacist 501. Pharmacist 501 scans bar code 425 from prescription form 418 using a bar code scanner 527. A computer 503 linked to the system uses the biometric data from two-dimensional bar code 425 to search for a match among the patient biometric files registered in the database. Where a match is found, the pharmacist views the matching data on the display of computer 503 that may include for example the name of the patient as found in the matching data file. The pharmacist compares the name information in the matching computer file to the identification and name given by patient 414. The pharmacist then asks patient 414 to input her fingerprint biometric data by placing her right index finger onto fingerprint scanner 505 linked to pharmacy computer 503. Computer 503 encodes and compares the patient 414 biometric data to bar code 425 from form

418. Alternatively the computer compares patient 414 input fingerprint biometric data to the database biometric data of the patient matched by the computer to the form 418 bar code 425. Where the identity of the patient is confirmed as matching the prescription form or alternatively matching the database in regards to name of the patient matched by the computer to the form 418 bar code 425, then the pharmacist proceeds to confirm the physician biometric data. The pharmacist scans the physician bar code 423 from the prescription form 418 and the computer searches the database for a match to the encoded physician iris data. The display of the pharmacy computer displays the matching physician name and the time and date the physician placed the medication order. Optionally where the pharmacist seeks additional confirmation, the pharmacist telephones the physician whose name is displayed by the pharmacy computer as matching bar code 423. Physician 412, in a location remote from the pharmacy, is requested by pharmacist 501 to verify that the physician prescribed the medication listed on the prescription form 418, for example a controlled substance, for patient 414. The physician enters his iris data using iris scanner 531 linked to his cellular telephone 533. The pharmacy computer 503 receives the physician 412 iris data encoded by iris scanner 531 via link to the cellular telephone and the computer compares the physician 412 iris data from the telephone input to the iris data from bar code 423 of form 418. Alternatively, iris data from the telephone can be compared to the iris data found in the matching physician file from the computer database. Where the computer confirms a match, then the computer displays the physician authorization as a match confirmation for the pharmacist on the display of the pharmacy computer 503. The computer optionally forms a

data file linking time and date of physician verification to the medication order in the database and to the physician name and BNDD number. A similar sequence of events may occur where physician 412 authorizes refills for patient for controlled substance medication. Physician 412 may know the condition of patient 414, for example cancer which is terminal and for which the prescribing of narcotic pain relief is appropriate. The physician may in this circumstance verify via telephone input of physician biometric to the pharmacy computer the fact that physician 412 has decided to authorize a refill of the prescription of the controlled substance for patient 414. Alternatively where the match of patient 414 biometric data in the database includes information the pharmacist interprets as a pattern of controlled substance abuse the pharmacist may decline to fill the prescription or alternatively alert physician 412 to the possible abuse of controlled substance medication by patient 414.

Turning now to Fig. 6, illustrated is a patient 601 in a hospital bed who has previously received a prescription order from his physician for medication. Said prescription order was sent to the pharmacy of the hospital on a prescription form that included the patient iris data as encoded in a two-dimensional bar code 425. The pharmacy has prepared the medication for patient 601 per instructions of the ordering physician. The pharmacy has placed the medication into an infusion bag 602 and the pharmacist has placed on the infusion bag exterior a sticker bearing two-dimensional bar code 425 encoding the patient iris data. The pharmacist has also placed a lock device 699 onto the outlet aspect of the infusion bag 602 wherein this lock device has a port to receive a computerized signal to unlock and release from the outlet aspect of the infusion bag when such

signal is received. Nurse 603 on the floor of a hospital has a belt mounted computer 607 with software enabled to compare encoded biometric iris data received from an iris scanner 605 linked thereto, to the biometric iris data received from bar code 425 using a bar code scanner 611 linked to computer 607. The nurse upon receiving the infusion bag containing the medication ordered for the patient proceeds to the bedside of the patient she believes to be patient 601 for whom she believes the medication is intended. The nurse using bar code scanner 611 scans two-dimensional bar code 425 from infusion bag 602 and computer 607 mounted on the nurse belt forms a data file of this encoded iris data which represents the patient iris data of the intended patient. The nurse then using iris scanner 605, scans the iris of the patient in the bed. The computer receives the iris data of the patient in the bed and compares this iris data to the iris data from two-dimensional bar code 423 on infusion bag 602. When the computer finds that the iris data match the computer sends a signal to clamp device 699 on the outlet aspect of the infusion bag to release, allowing the nurse to administer the infusion. When the computer finds no match, the computer does not send a signal to the clamp device on the outlet aspect of the infusion bag to release, preventing the nurse from administering the infusion.

Turning now to Fig. 7, illustrated is the use of the Internet for prescribing and filling prescriptions using the instant invention such as for internet pharmacy websites such as www.SOMA.com or www.worldwidemedicine.com. Also illustrated is the use of the invention wherein the steps of the method are used with, and the devices of the system and apparatus of the instant invention are linked to the web site of

an Internet pharmacy 799. The patient 414 is shown entering biometric data from home computer linked biometric scanners 701 and 797 wherein the Internet pharmacy computer receives the encoded patient biometric data via a home computer 703 optionally over high speed digital subscriber line such as DSL lines provided by Covad Company of San Jose, California. The database computer of the Internet pharmacy matches the biometric data to the patient name and registration previously received when patient registration occurred preferably at the physician office as described above. The input by the Internet linked physician 412 of the order for medication for patient 414 occurs optionally to include input by the physician 412 of his biometric data into the computer of the Internet linked pharmacy via physician biometric scanners 705 and 795 linked to physician computer 707. The Internet pharmacy computer registers the order as a linked data file in the Internet pharmacy computer database which database optionally is audited and reports generated in a manner similar to that described in Figs. 1 and 2 above. The mailing of the prescription medication to patient 414 occurs from the Internet pharmacy and e-mail summarizing and documenting the filling of the prescription is sent by the Internet pharmacy to the physician who prescribed the medication and optionally to the State Board of Pharmacy of other governing body.

It is understood that the invention herein disclosed as preferred embodiment is for illustrative purposes. Various changes and modifications to the embodiments herein chosen for purposes of illustration will readily occur to those skilled in the art, for example the use of this invention in the case of inpatient medications can utilize the nurse and a computer attached to the medication cart. For the case

of one person picking up a medication for another person, then the system can record the biometric data of the person picking up the medication and link that data to the file of the transaction for later review. Furthermore, where such second person picks up a prescription medication for another, the patient for whom the medication is intended can optionally be reached by telephone and where a linked scanner is at the patient's phone then patient biometric data can be obtained from that person remotely and compared to the biometric data of the intended patient by the computer of the pharmacist. Furthermore, the invention herein disclosed is also envisioned to be used as a national database of biometric codes suitable for matching to the biometric code of a person such as a physician useful for example in researching the association of medical practice liability claims state to state to a particular practitioner. It is envisaged that still other embodiments are possible within the scope of the invention herein disclosed and those other embodiments are included in the invention herein disclosed. For example the cellular telephone with built in biometric iris scanner is envisioned to be useful for verification of identity of the user of the telephone in relation to many other applications. For example the instant invention is envisioned to be used where the user of the telephone is a non-medical individual and where the user is providing his biometric data to a computer containing a database of encoded biometric data used to authorize purchases or sales of various goods and services, both professional and non-professional. Similarly, the instant invention of the website-based use of computer matching of encoded biometric data is envisioned to be useful in a variety of non-medical uses including the Internet linked website receipt of identity verification

of the individual authorizing Internet purchases or sales of various goods and services. Also, one skilled in the art will realize that biometric measurements or data can be encoded on a storage medium by the computers to which the various sampling devices are coupled, by the sampling devices themselves, which read the biometric measurements or data or any combination thereof. Furthermore, the encoded biometric data may be sent to a remote site for storage either electronically or by hard copy. For example, as detailed in the previous description, the encoded biometric data may be in the form of a two-dimensional bar code. It should be understood by those skilled in the art that while, in the preferred embodiment a physician is ordering a prescription, other professionals may be involved in other professional activities, herein recorded and audited within the scope of the instant invention such as pharmacist, chiropractor, surrogate of licensed professional, patient, dentist, dental hygienist, medical technologist, nurse, surgeon, emergency medical technician, medical assistant, lawyer, broker, physician assistant, optometrist or optometry technician, engineer, certified public accountant, psychologist pursuing such activities as verifying attendance at professional education courses, re-licensing and other types of professional testing, verification or authorization of contracts such as professional contracts, purchasing of professional supplies, authenticating professional billing, obtaining release of or authorizing access to patient information or other professional confidential information.

To the extent such modifications and variations do not depart from the spirit of the invention, they are intended to be included within the scope thereof.

CLAIMS

1. A method of recording human activity including the step of recording at least one aspect of said activity using two-dimensional bar code.

2. The method of claim 1 wherein the activity is at least partly a professional activity of a licensed professional.

3. The method of claim 2 wherein the professional activity involves at least one from the following list: physician, pharmacist, chiropractor, surrogate of licensed professional, patient, dentist, dental hygienist, medical technologist, nurse, surgeon, emergency medical technician, medical assistant, lawyer, broker or appraiser, physician assistant, optometrist, optometry technician, engineer, certified public accountant,psychologist.

4. The method of claim 2 wherein the professional activity is a medication prescription order.

5. The method of claim 2 wherein a biometric code of at least one of said professionals is encoded in a two-dimensional bar code.

6. The method of claim 1 wherein the date of said activity is encoded using a two-dimensional bar code.

7. The method of claim 6 wherein the recorded activity is audited using biometric data.

8. The method of claim 4 further including preparing a prescription form bearing a two-dimensional bar code.

9. The method of claim 8 wherein the prescription form two-dimensional bar code encodes at least the identity of the intended recipient of the prescribed medication.

10. A method of authorizing an action comprising the steps of:

providing recorded biometric data;

obtaining biometric data from an individual;

comparing the obtained biometric data from said individual with the recorded biometric data; and

proceeding with the action upon matching the obtained biometric data with the recorded biometric data.

11. A method as claimed in claim 10 wherein the step of providing recorded biometric data includes encoding the recorded biometric data for processing.

12. A method as claimed in claim 11 wherein the step of obtaining biometric data includes encoding the obtained biometric data for processing.

13. A method as claimed in claim 12 wherein the step of comparing includes introducing the encoded recorded biometric data and the encoded obtained biometric data into a computer.

14. A method as claimed in claim 13 wherein the step of encoding the recorded biometric data and the step of encoding the obtained biometric data includes

scanning the recorded biometric data and the obtained biometric data, respectively.

15. A method as claimed in claim 14 wherein the step of introducing the recorded biometric data to the computer includes retrieving the information from a storage medium.

16. A method as claimed in claim 10 wherein the step of providing recorded biometric data and the step of obtaining biometric data apply to a first individual, and the method further includes the steps of:

providing recorded biometric data for a second individual;

obtaining biometric data from the second individual;

comparing the obtained biometric data from said second individual with the recorded biometric data from the second individual; and

proceeding with the action upon matching the obtained biometric data from the second individual with the recorded biometric data from the second individual.

17. A method as claimed in claim 16 wherein the step of providing recorded biometric data for a second individual includes retrieving the recorded biometric data for a second individual from a database.

18. A method as claimed in claim 17 wherein the step of obtaining biometric data from the second individual includes retrieving the obtained biometric data for the second individual from one of a telephone, E-mail, computer network, or hardcopy.

19. A method of filling a prescription for medication comprising the steps of:

determining medication for a patient by a physician;

filling out a prescription form and linking patient biometric data from the patient to the form;

presenting the form with linked patient biometric data to a pharmacy;

obtaining patient biometric data at the pharmacy;

comparing the obtained biometric data from the patient with the linked biometric data; and

filling the prescription upon matching the obtained patient biometric data with the linked patient biometric data.

20. A method as claimed in claim 10 wherein the step of linking patient biometric data includes scanning and encoding the patient biometric data for processing in a computer.

21. A method as claimed in claim 20 wherein the step of presenting the form includes a hard copy of the form with linked patient biometric data being presented to the pharmacy.

22. A method as claimed in claim 21 wherein the step of linking patient biometric data further includes printing a representation of the encoded patient biometric data.

23. A method as claimed in claim 22 wherein the step of obtaining patient biometric data at the pharmacy includes scanning and encoding patient biometric data from the patient for processing in a computer.

24. A method as claimed in claim 20 wherein the step of presenting the form includes sending an electronic copy of the form with linked patient biometric data to a computer at the pharmacy.

25. A method as claimed in claim 24 wherein the pharmacy is an Internet pharmacy.

26. A method as claimed in claim 25 wherein the prescription form with linked biometric data is sent to the Internet pharmacy over the Internet.

27. A method as claimed in claim 19 wherein the step of filling a prescription further includes the steps of obtaining biometric data from the physician and linking the biometric data from the physician to the prescription form.

28. A method as claimed in claim 27 wherein the step of presenting the prescription form to the pharmacy includes:

comparing the linked biometric data from the physician with previously recorded biometric data from the physician accessible by the computer at the pharmacy proceeding with the filling of the prescription upon matching the linked biometric data from the physician with the recorded biometric data from the physician.

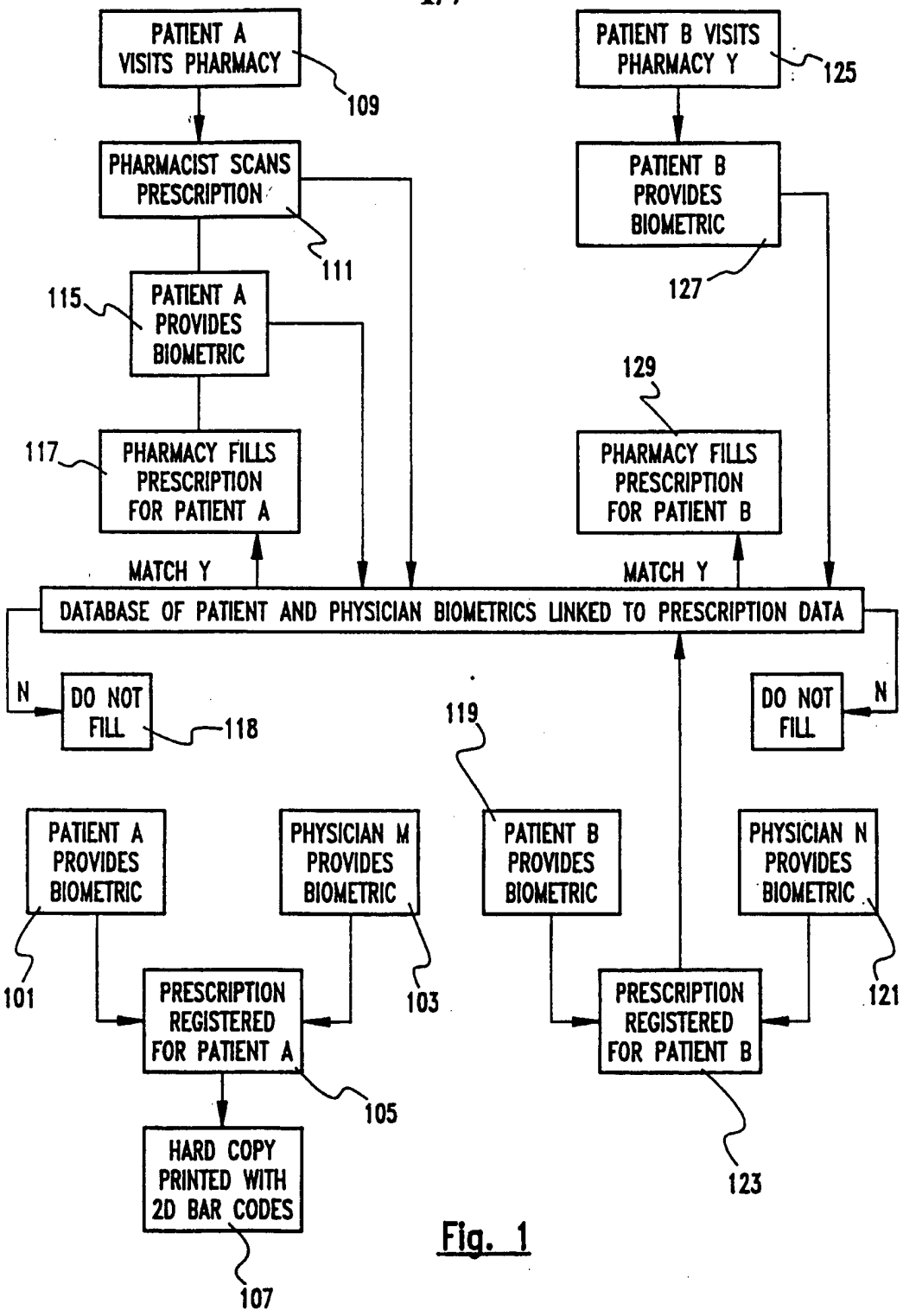
PATIENT A VISITS PHARMACY
109
PATIENT B VISITS PHARMACY Y
125
PHARMACIST SCANS PRESCRIPTION
111
PATIENT B PROVIDES BIOMETRIC
127
115
PATIENT A PROVIDES BIOMETRIC
129
117
PHARMACY FILLS PRESCRIPTION FOR PATIENT A
PHARMACY FILLS PRESCRIPTION FOR PATIENT B
MATCH Y
MATCH Y
DATABASE OF PATIENT AND PHYSICIAN BIOMETRICS LINKED TO PRESCRIPTION DATA
N
DO NOT FILL
118
DO NOT FILL
N
119
PATIENT A PROVIDES BIOMETRIC
PHYSICIAN M PROVIDES BIOMETRIC
PATIENT B PROVIDES BIOMETRIC
PHYSICIAN N PROVIDES BIOMETRIC
101
103
121
PRESCRIPTION REGISTERED FOR PATIENT A
PRESCRIPTION REGISTERED FOR PATIENT B
105
123
HARD COPY PRINTED WITH 2D BAR CODES
107

Fig. 1

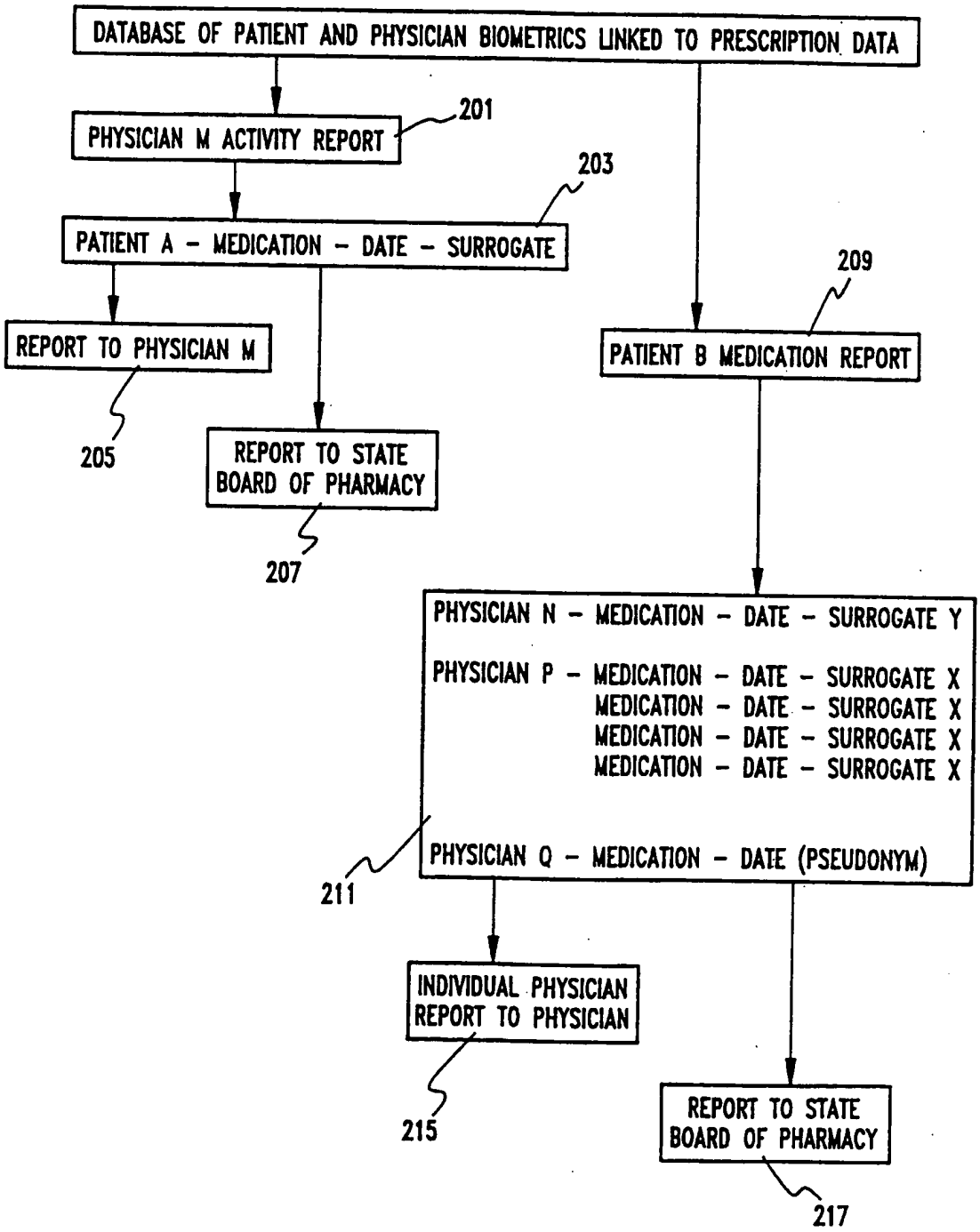
DATABASE OF PATIENT AND PHYSICIAN BIOMETRICS LINKED TO PRESCRIPTION DATA
PHYSICIAN M ACTIVITY REPORT
201
PATIENT A – MEDICATION – DATE – SURROGATE
203
REPORT TO PHYSICIAN M
205
REPORT TO STATE BOARD OF PHARMACY
207
209
PATIENT B MEDICATION REPORT
PHYSICIAN N – MEDICATION – DATE – SURROGATE Y
PHYSICIAN P – MEDICATION – DATE – SURROGATE X
MEDICATION – DATE – SURROGATE X
MEDICATION – DATE – SURROGATE X
MEDICATION – DATE – SURROGATE X
PHYSICIAN Q – MEDICATION – DATE (PSEUDONYM)
211
INDIVIDUAL PHYSICIAN REPORT TO PHYSICIAN
215
REPORT TO STATE BOARD OF PHARMACY
217

Fig. 2

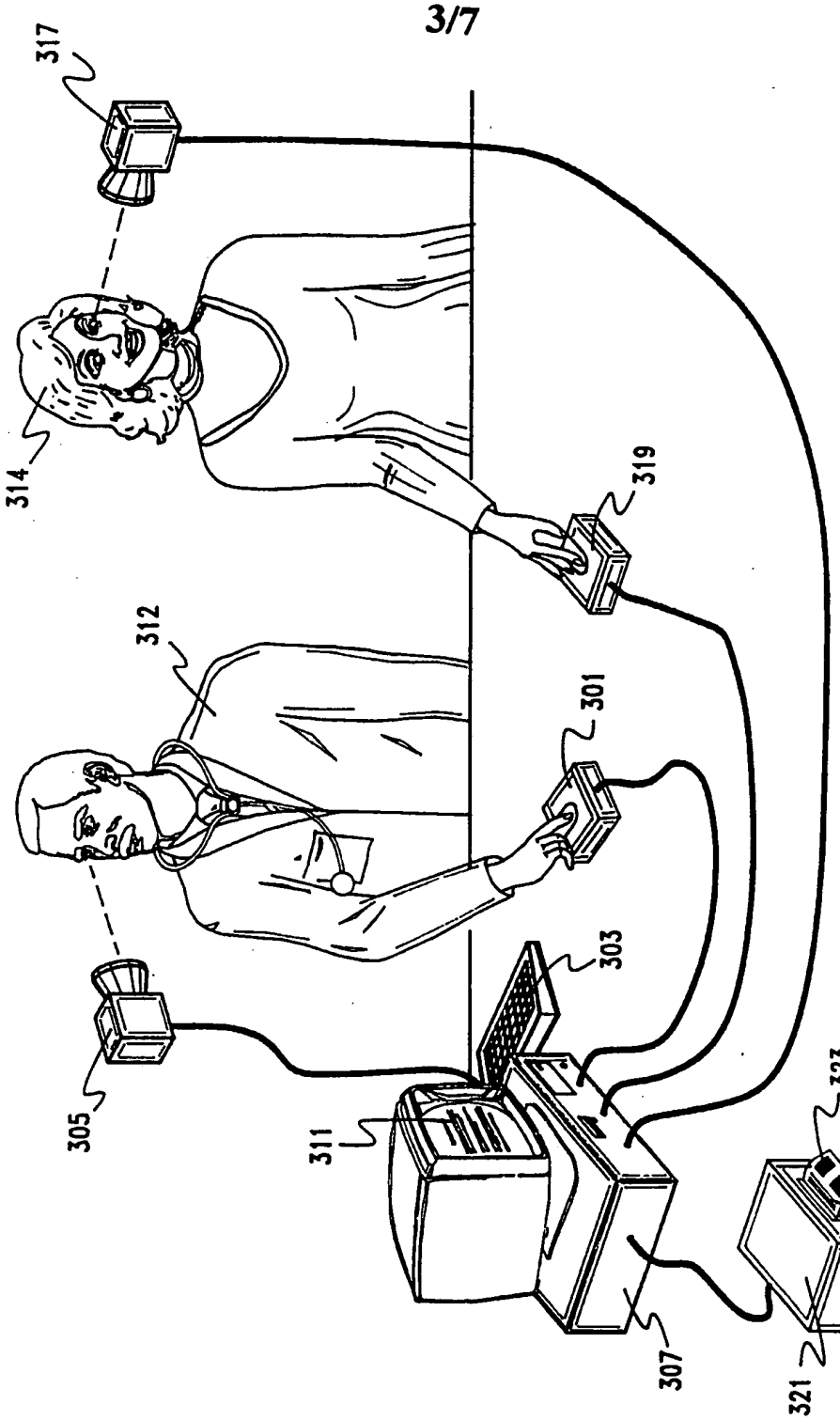

Fig 3

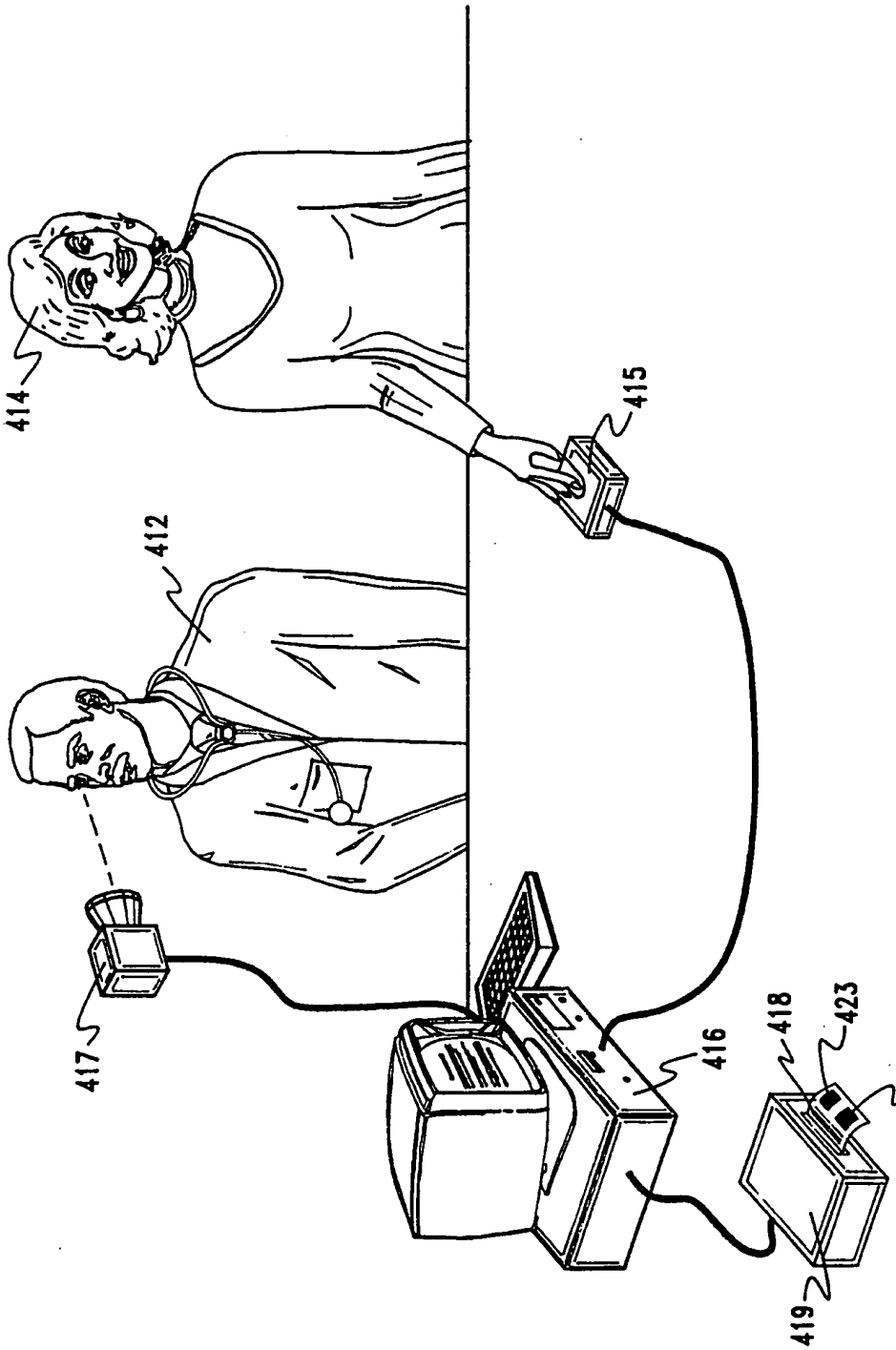

Fig 4

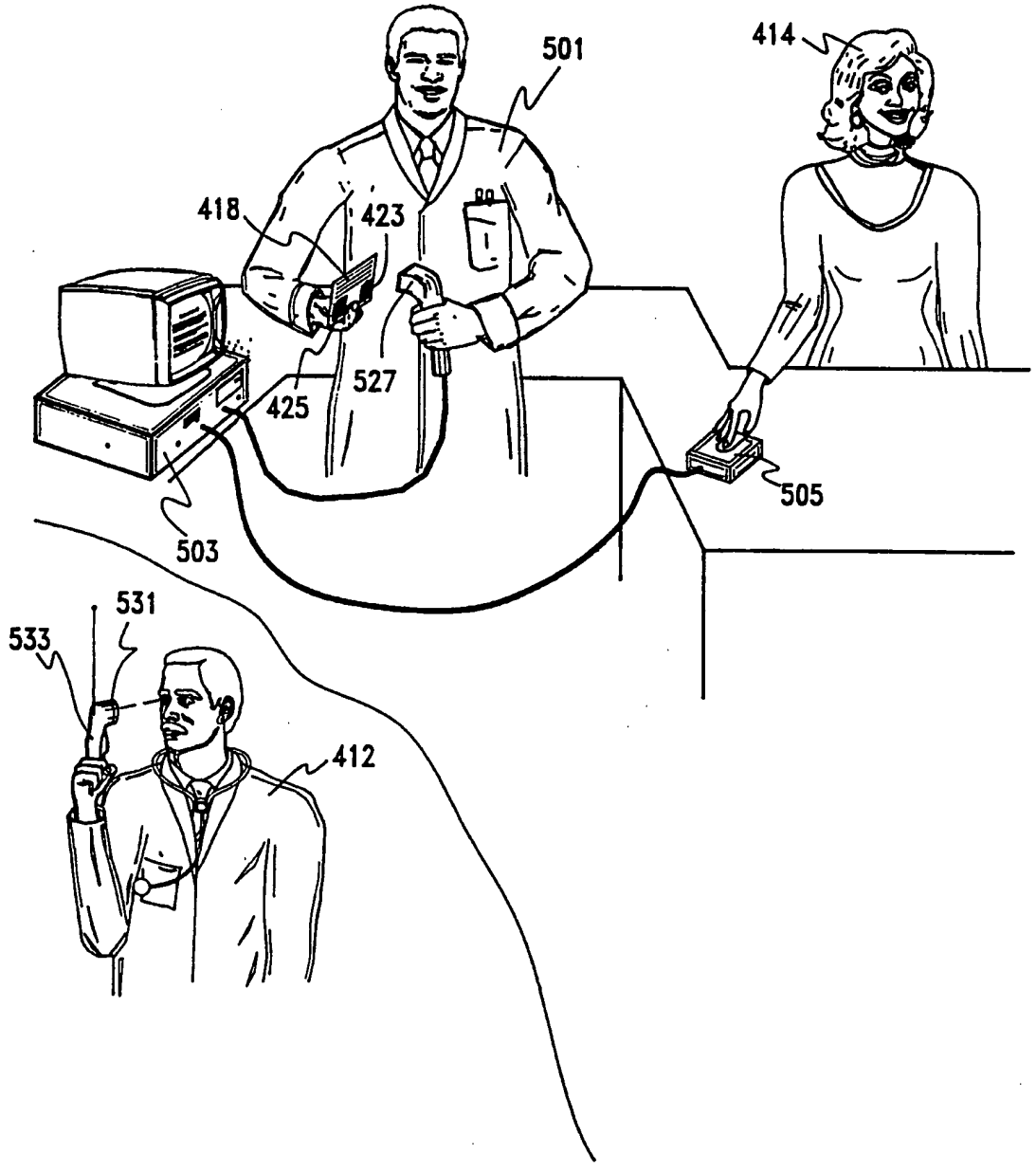

Fig 5

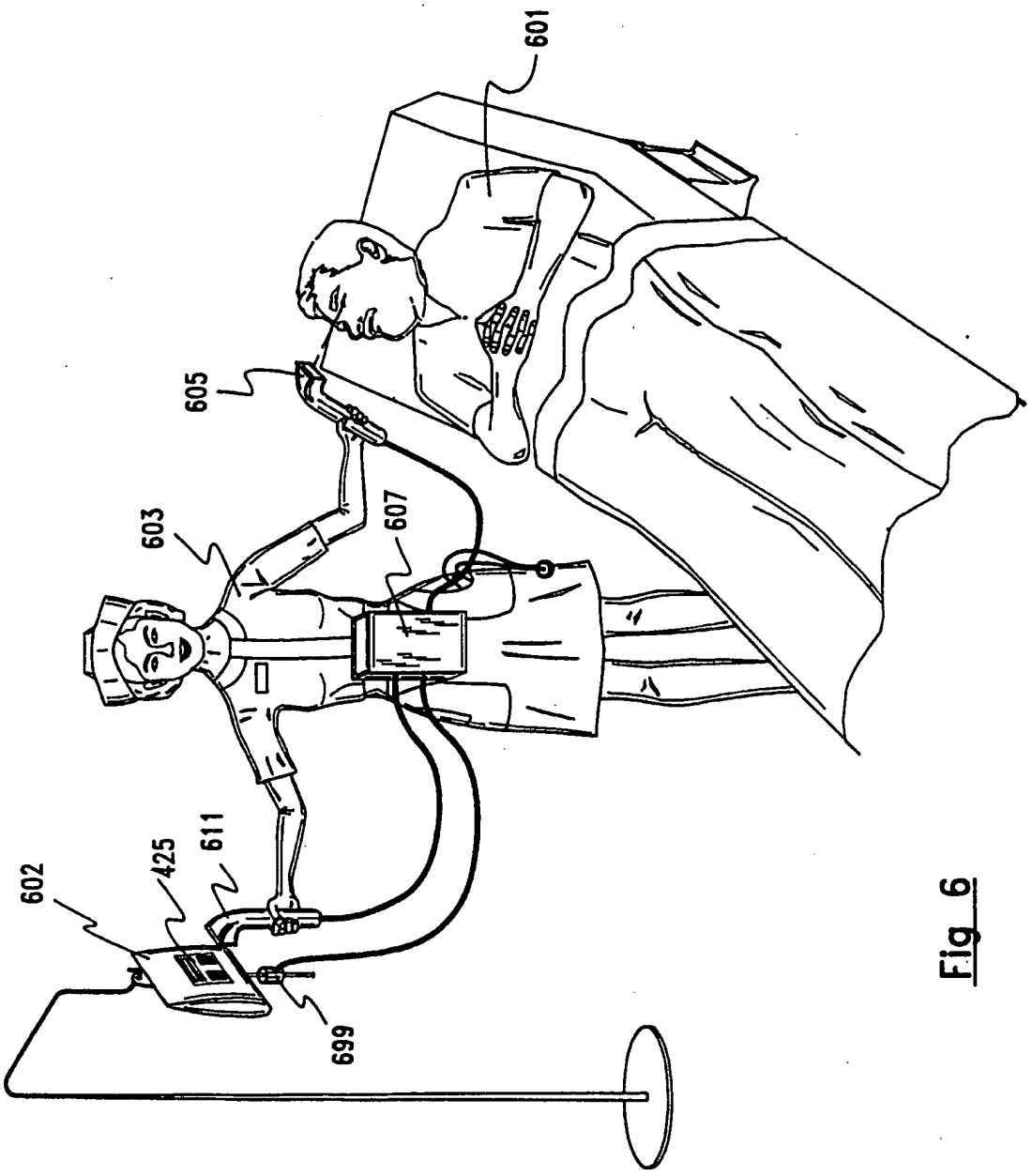

Fig 6

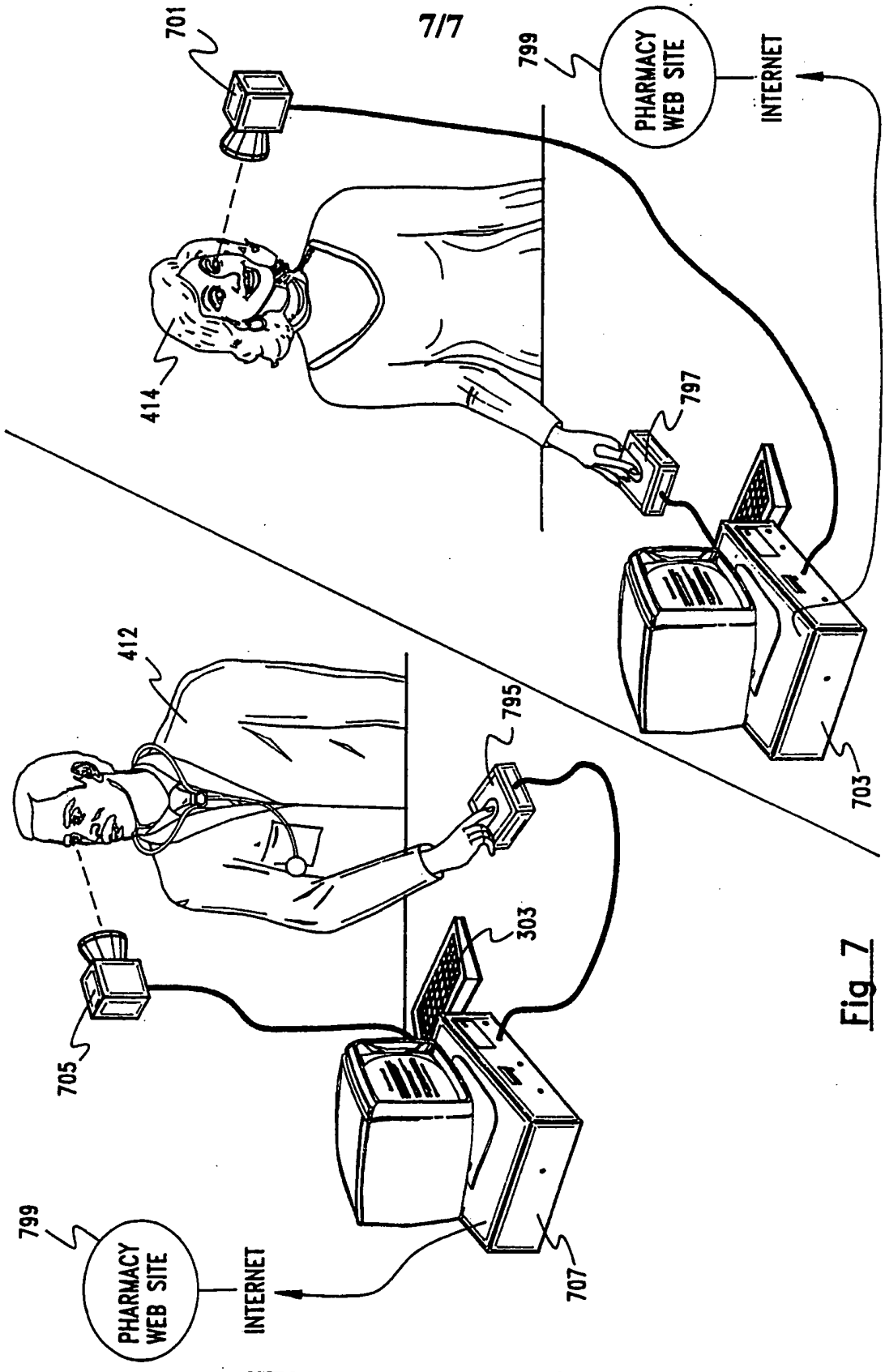
701
799
PHARMACY WEB SITE
INTERNET
414
797
703
412
795
303
705
799
PHARMACY WEB SITE
INTERNET
707

Fig 7

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US99/08120

A. CLASSIFICATION OF SUBJECT MATTER

IPC(6) :A61B 5/00
US CL :600/300
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 128/898; 235/375, 462, 472; 283/69; 379/93.03; 382/115; 600/300

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

APS
Search Terms: biometric data, human activity, two-dimensional, 2-D, prescription, pharmacist, authorization

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 4,993,068 A (PIOSENKA et al) 02 February 1991, entire document.	1-28
A	US 5,381,487 A (SHAMOS) 10 January 1995, entire document.	1-28
A	US 5,505,494 A (BELLUCI et al) 09 April 1996, entire document.	1-28
A,P	US 5,883,370 A (WALKER et al) 16 March 1999, entire document.	1-28

☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

*	Special categories of cited documents:	"T"	later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A"	document defining the general state of the art which is not considered to be of particular relevance	"X"	document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"E"	earlier document published on or after the international filing date	"Y"	document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"L"	document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"&"	document member of the same patent family
"O"	document referring to an oral disclosure, use, exhibition or other means		
"P"	document published prior to the international filing date but later than the priority date claimed		

Date of the actual completion of the international search 28 JUNE 1999	Date of mailing of the international search report 16 JUL 1999
Name and mailing address of the ISA/US Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231 Facsimile No. (703) 305-3230	Authorized officer CHARLES MARMOR II Telephone No. (703) 305-3521

Form PCT/ISA/210 (second sheet)(July 1992)★